



SEQUENCE LISTING

<110> Jongsma, Maarten Anthonie
Strukelj, Borut
Lenarcic, Brigita
Gruden, Kristina
Turk, Vito
Bosch, Hendrik J.
Stiekema, Willem Johannes

<120> A Method for Plant Protection Against Insects or Nematodes

<130> 250308-1020

<140> 09/445,480

<141> 2000-07-07

<150> PCT/NL98/00352

<151> 1998-06-18

<160> 42

<170> PatentIn version 3.2

<210> 1

<211> 888

<212> DNA

<213> Actinia equina

<300>

<301> Gruden, Kristina; Strukelj, Borut; Popovic, Tatjana; Lenarci
C,

Brigita; Bevec, Tadeja; Brzin, Joze; Kregar, Igor;
Herzog-Velikonja, Jana; Stiekema, Willem J; Bosch, Dirk

<302> The Cysteine Protease Activity of Colorado Potato Beetle
(Leptinotarsa decemlineata) Guts, Which is Insensitive to Po
tato

Protease Inhibitors, is Inhibited by Thyroglobulin Type-1

<303> Insect Biochem. Mol. Biol

<304> 28

<306> 549-560

<307> 1998

<400> 1

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tactattcat tgcttgtgct ataacttcaa ctgaagctag tctaacccaaa tgccaacagc

120

tccaggcctc ggctaacagt ggtctgatag gtacttatgt accacaatgc aaagaaacgg
180

gagagttcga agaaaaacaa tgctggggat cgactgggta ctggttggtgt gtggatgaag
240

atggaaaaga gattctagga accaagatcc gtggatctcc ggattgcagc cgcagaaaag
300

ccgcgttaac actttgccag atgatgcaag ccatcattgt taatgtccct ggttggtgtg
360

gccctccatc gtgtaaagct gacggcagtt ttgacgaggt tcagtgctgc gcaagtaatg
420

gagaatgcta ctgtgtggat aagaaaggaa aagaacttga aggcacaaga caacagggaa
480

ggccaacctg cgaaagacac ctaagcgaat gcgaggaagc tcgaatcaag gcgcattcaa
540

acagtcttcg tgttgagatg ttcgtgccag agtgttttaga agatggatca tataaccag
600

tacagtgtcg gcctagcaca ggatactggt ggtgcgtcga tgaaggaggg gtaaagggtac
660

caggttccga tgtcagattt aaacgccccca catgctaaga aaaacacagt gaacaaagtg
720

gctagtttcc agatcgaaaa taactacaaa ggattaataa aatgttaaaa taattttctca
780

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840

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888

<210> 2
<211> 231
<212> PRT
<213> Actinia equina

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Ser	Leu	Thr	Lys	Cys	Gln	Gln	Leu	Gln	Ala	Ser	Ala	Asn	Ser	Gly	Leu	35	40	45	
Ile	Gly	Thr	Tyr	Val	Pro	Gln	Cys	Lys	Glu	Thr	Gly	Glu	Phe	Glu	Glu	50	55	60	
Lys	Gln	Cys	Trp	Gly	Ser	Thr	Gly	Tyr	Cys	Trp	Cys	Val	Asp	Glu	Asp	65	70	75	80
Gly	Lys	Glu	Ile	Leu	Gly	Thr	Lys	Ile	Arg	Gly	Ser	Pro	Asp	Cys	Ser	85	90	95	
Arg	Arg	Lys	Ala	Ala	Leu	Thr	Leu	Cys	Gln	Met	Met	Gln	Ala	Ile	Ile	100	105	110	
Val	Asn	Val	Pro	Gly	Trp	Cys	Gly	Pro	Pro	Ser	Cys	Lys	Ala	Asp	Gly	115	120	125	
Ser	Phe	Asp	Glu	Val	Gln	Cys	Cys	Ala	Ser	Asn	Gly	Glu	Cys	Tyr	Cys	130	135	140	
Val	Asp	Lys	Lys	Gly	Lys	Glu	Leu	Glu	Gly	Thr	Arg	Gln	Gln	Gly	Arg	145	150	155	160
Pro	Thr	Cys	Glu	Arg	His	Leu	Ser	Glu	Cys	Glu	Glu	Ala	Arg	Ile	Lys	165	170	175	
Ala	His	Ser	Asn	Ser	Leu	Arg	Val	Glu	Met	Phe	Val	Pro	Glu	Cys	Leu	180	185	190	

Glu Asp Gly Ser Tyr Asn Pro Val Gln Cys Trp Pro Ser Thr Gly Tyr
 195 200 205

Cys Trp Cys Val Asp Glu Gly Gly Val Lys Val Pro Gly Ser Asp Val
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Arg Phe Lys Arg Pro Thr Cys
 225 230

<210> 3
 <211> 696
 <212> DNA
 <213> artificial

<220>
 <223> synthetic sequence

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 120

caggcctcgg ctaacagtgg tctgataggt acttatgtac cacaatgcaa agaaactgga
 180

gagtttgaag aaaagcaatg ctggggatcg actgggttact gttgggtgtgt ggatgaagat
 240

ggaaaagaga ttctaggtac aaagatccgt ggatctccag actgcagtcg cagaaaagct
 300

gccttaacac ttgcccagat gatgcaagcc atcattgtga atgtccctgg ttgggtgtgga
 360

cctccatcat gtaaagctga cggcagtttt gacgaggttc agtgctgcgc aagtaatgga
 420

gaatgctact gtgtggataa gaaaggaaaa gaacttgaag gcacaagaca acagggaagg
 480

ccaacctgcg aaagacacct aagcgaatgc gaggaggctc gatatcaaggc acattcaaac
 540

agtcttcgtg ttgagatggt cgtgccagag tgtttagaag atggatctta caaccctgta
600

cagtgctggc ctagcacagg atactgttgg tgcgtcgatg aaggaggggt aaaggttcca
660

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<220>
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<400> 4

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Met	Ile	Trp	Val	Leu	Phe	Ile	Ala	Cys	Ala	Ile	Thr	Ser	Thr	Gln	Ala
			20					25						30	

Ser	Leu	Thr	Lys	Cys	Gln	Gln	Leu	Gln	Ala	Ser	Ala	Asn	Ser	Gly	Leu
			35				40					45			

Ile	Gly	Thr	Tyr	Val	Pro	Gln	Cys	Lys	Glu	Thr	Gly	Glu	Phe	Glu	Glu
	50					55					60				

Lys	Gln	Cys	Trp	Gly	Ser	Thr	Gly	Tyr	Cys	Trp	Cys	Val	Asp	Glu	Asp
65					70					75				80	

Gly	Lys	Glu	Ile	Leu	Gly	Thr	Lys	Ile	Arg	Gly	Ser	Pro	Asp	Cys	Ser
				85					90					95	

Arg	Arg	Lys	Ala	Ala	Leu	Thr	Leu	Cys	Gln	Met	Met	Gln	Ala	Ile	Ile
			100					105					110		

Val Asn Val Pro Gly Trp Cys Gly Pro Pro Ser Cys Lys Ala Asp Gly
 115 120 125

Ser Phe Asp Glu Val Gln Cys Cys Ala Ser Asn Gly Glu Cys Tyr Cys
 130 135 140

Val Asp Lys Lys Gly Lys Glu Leu Glu Gly Thr Arg Gln Gln Gly Arg
 145 150 155 160

Pro Thr Cys Glu Arg His Leu Ser Glu Cys Glu Glu Ala Arg Ile Lys
 165 170 175

Ala His Ser Asn Ser Leu Arg Val Glu Met Phe Val Pro Glu Cys Leu
 180 185 190

Glu Asp Gly Ser Tyr Asn Pro Val Gln Cys Trp Pro Ser Thr Gly Tyr
 195 200 205

Cys Trp Cys Val Asp Glu Gly Gly Val Lys Val Pro Gly Ser Asp Val
 210 215 220

Arg Phe Lys Arg Pro Thr Cys
 225 230

<210> 5
 <211> 18
 <212> DNA
 <213> artificial

<220>
 <223> primer

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 <222> (3)..(3)
 <223> n = A, C, G, T

<220>

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<221>  misc_feature
<222>  (6)..(6)
<223>  n = A, C, G, T

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<220>
<221>  misc_feature
<222>  (9)..(9)
<223>  n = A, G

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<220>
<221>  misc_feature
<222>  (12)..(12)
<223>  n = T, C

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<220>
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<222>  (15)..(15)
<223>  n = A, G

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<220>
<221>  misc_feature
<222>  (18)..(18)
<223>  n = A, G

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<210>  6
<211>  21
<212>  DNA
<213>  artificial

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<220>
<223>  primer

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<220>
<221>  misc_feature
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<223>  n = A, G

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<220>
<221>  misc_feature
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<223>  n = A, C, G, T

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 <222> (10)..(10)
 <223> n = A, C, G, T

<220>
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 <222> (13)..(13)
 <223> n = A, C, G, T

<220>
 <221> misc_feature
 <222> (16)..(16)
 <223> n = T, C

<220>
 <221> misc_feature
 <222> (19)..(19)
 <223> n = A, G

<400> 6
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 21

<210> 7
 <211> 48
 <212> PRT
 <213> artificial

<220>
 <223> conserved sequence

<220>
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 <222> (1)..(48)
 <223> X = any amino acid

<400> 7

Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Pro Xaa Cys
 1 5 10 15

Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa Gln Cys Xaa Xaa Xaa Xaa Xaa
 20 25 30

Xaa Cys Thr Cys Val Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa Xaa Cys
 35 40 45

<210> 8
 <211> 7
 <212> PRT
 <213> artificial

<220>
 <223> synthetic substrate

<220>
 <221> MISC_FEATURE
 <222> (5)..(5)
 <223> X = nitrophenylalanine

<400> 8

Pro Thr Glu Phe Xaa Arg Leu
 1 5

<210> 9
 <211> 30
 <212> DNA
 <213> artificial

<220>
 <223> primer

<400> 9
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 30

<210> 10
 <211> 30
 <212> DNA
 <213> artificial

<220>
 <223> primer

<400> 10
 ggggtgcggcc gcgcatgtgg ggcgttttaa

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<210> 11
 <211> 31
 <212> DNA
 <213> artificial

<220>
 <223> primer

<400> 11
 gggggggaat tcctgacctc ttactaactc g
 31

<210> 12
 <211> 47
 <212> DNA
 <213> artificial

<220>
 <223> primer

<400> 12
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 47

<210> 13
 <211> 30
 <212> DNA
 <213> artificial

<220>
 <223> primer

<400> 13
 agatctgagc tctcgttcaa acatttggca
 30

<210> 14
 <211> 27
 <212> DNA
 <213> artificial

<220>

<223> primer

<400> 14
aagcttgaat tcgatctagt aacatag
27

<210> 15
<211> 24
<212> DNA
<213> artificial

<220>
<223> primer

<400> 15
ggggccatgg ctcttagcca aaac
24

<210> 16
<211> 32
<212> DNA
<213> artificial

<220>
<223> primer

<400> 16
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<210> 17
<211> 6
<212> PRT
<213> artificial

<220>
<223> conserved sequence

<400> 17
Gly Tyr Cys Trp Cys Val
1 5

<210> 18

<211> 65
 <212> PRT
 <213> Human Invariant Chain

<400> 18

Leu Thr Lys Cys Gln Glu Glu Val Ser His Ile Pro Ala Val His Pro
 1 5 10 15

Gly Ser Phe Arg Pro Lys Cys Asp Glu Asn Gly Asn Tyr Leu Pro Leu
 20 25 30

Gln Cys Tyr Gly Ser Ile Gly Tyr Cys Trp Cys Val Phe Pro Asn Gly
 35 40 45

Thr Glu Val Pro Asn Thr Arg Ser Arg Gly His His Asn Cys Ser Glu
 50 55 60

Ser
 65

<210> 19
 <211> 67
 <212> PRT
 <213> rat invariant chain

<400> 19

Lys Val Leu Thr Lys Cys Gln Glu Glu Val Ser His Ile Pro Asp Val
 1 5 10 15

His Pro Gly Ala Phe Arg Pro Lys Val Asp Glu Asn Gly Asn Tyr Met
 20 25 30

Pro Leu Gln Cys His Gly Ser Thr Gly Tyr Cys Trp Cys Val Phe Pro
 35 40 45

Asn Gly Thr Glu Val Pro His Thr Lys Ser Arg Gly Arg His Asn Cys
 50 55 60

Ser Glu Pro
65

<210> 20
<211> 74
<212> PRT
<213> chum salmon egg inh.

<400> 20

His Val Pro Ile Asp Gly Ile Phe His Leu Lys Thr Pro Cys Glu Leu
1 5 10 15

Ala Arg Asp Ala Ala Thr His Gly Pro Ile Gly Gly Phe Ile Pro Thr
20 25 30

Cys Asp Tyr Asn Gly Gln Tyr Thr Pro Glu Gln Cys Trp Gly Ser Thr
35 40 45

Gly Tyr Cys Trp Cys Val Asn Ser Ser Gly Gln Lys Leu Pro Gly Thr
50 55 60

Asp Thr Pro Pro Gly Ser Ala Ser Asn Cys
65 70

<210> 21
<211> 69
<212> PRT
<213> Mouse Nidogen

<400> 21

Glu His Ile Leu Gly Ala Ala Gly Gly Ala Asp Ala Gln Arg Pro Thr
1 5 10 15

Leu Gln Gly Met Phe Val Pro Gln Cys Asp Glu Tyr Gly His Tyr Val
20 25 30

Pro Thr Gln Cys His His Ser Thr Gly Tyr Cys Trp Cys Val Asp Arg

35

40

45

Asp Gly Arg Glu Leu Glu Gly Ser Arg Thr Pro Pro Gly Met Arg Pro
 50 55 60

Pro Cys Leu Ser Thr
 65

<210> 22
 <211> 68
 <212> PRT
 <213> Human Epithelial Glycoprot

<400> 22

Gly Ser Lys Leu Gly Arg Arg Ala Lys Pro Glu Gly Ala Leu Gln Asn
 1 5 10 15

Asn Asp Gly Leu Tyr Asp Pro Asp Cys Asp Glu Ser Gly Leu Phe Lys
 20 25 30

Ala Lys Gln Cys Asn Gly Thr Ser Met Cys Trp Cys Val Asn Thr Ala
 35 40 45

Gly Val Arg Arg Thr Asp Lys Asp Thr Glu Ile Thr Cys Ser Glu Arg
 50 55 60

Val Arg Thr Tyr
 65

<210> 23
 <211> 65
 <212> PRT
 <213> Bull Frog Saxiphilin

<400> 23

Lys Cys Leu Lys Glu Arg Gln Val Ala Leu Gly Gly Asp Glu Lys Val
 1 5 10 15

Leu Gly Arg Phe Val Pro Gln Cys Asp Glu Lys Gly Asn Tyr Glu Pro
 20 25 30

Gln Gln Phe His Gly Ser Thr Gly Tyr Ser Trp Cys Val Asn Ala Ile
 35 40 45

Gly Glu Glu Ile Ala Gly Thr Lys Thr Pro Pro Gly Lys Ile Pro Ala
 50 55 60

Cys
 65

<210> 24
 <211> 45
 <212> PRT
 <213> Thyroglobulin 1.1

<400> 24

Tyr Val Pro Gln Cys Ala Glu Asp Gly Ser Phe Gln Thr Val Gln Cys
 1 5 10 15

Gln Asn Asp Gly Arg Ser Cys Trp Cys Val Gly Ala Asn Gly Ser Glu
 20 25 30

Val Leu Gly Ser Arg Gln Pro Gly Arg Pro Val Ala Cys
 35 40 45

<210> 25
 <211> 45
 <212> PRT
 <213> Thyroglobulin 1.2

<400> 25

Tyr Leu Pro Gln Cys Gln Asp Ser Gly Asp Tyr Ala Pro Val Gln Cys
 1 5 10 15

Asp Val Gln His Val Gln Cys Trp Cys Val Asp Ala Glu Gly Met Glu

20

25

30

Val Tyr Gly Thr Arg Gln Leu Gly Arg Pro Lys Arg Cys
 35 40 45

<210> 26

<211> 43

<212> PRT

<213> Thyroglobulin 1.5

<400> 26

Phe Val Pro Ser Cys Thr Thr Glu Gly Ser Tyr Glu Asp Val Gln Cys
 1 5 10 15

Phe Ser Gly Glu Cys Trp Cys Val Asn Ser Trp Gly Lys Glu Leu Pro
 20 25 30

Gly Ser Arg Val Arg Asp Gly Gln Pro Arg Cys
 35 40

<210> 27

<211> 44

<212> PRT

<213> Thyroglobulin 1.6

<400> 27

Phe Val Pro Ala Cys Thr Ser Glu Gly His Phe Leu Pro Val Gln Cys
 1 5 10 15

Phe Asn Ser Glu Cys Tyr Cys Val Asp Ala Glu Gly Gln Ala Ile Pro
 20 25 30

Gly Thr Arg Ser Ala Ile Gly Lys Pro Lys Lys Cys
 35 40

<210> 28

<211> 70

<212> PRT

<213> Bovine Thyroglobulin

<400> 28

Gln Cys Pro Ser Leu Cys Glu Val Leu Gln Ser Gly Val Pro Ser Arg
1 5 10 15

Arg Thr Ser Pro Gly Tyr Ser Pro Ala Cys Arg Ala Glu Asp Gly Gly
20 25 30

Phe Ser Pro Val Gln Cys Asp Pro Ala Gln Gly Ser Cys Trp Cys Val
35 40 45

Leu Gly Ser Gly Glu Glu Val Pro Gly Thr Arg Val Ala Gly Ser Gln
50 55 60

Pro Ala Cys Glu Ser Pro
65 70

<210> 29

<211> 80

<212> PRT

<213> Mouse Entactin

<400> 29

Lys Thr Arg Cys Gln Leu Glu Arg Glu His Ile Leu Gly Ala Ala Gly
1 5 10 15

Gly Ala Asp Ala Gln Arg Pro Thr Leu Gln Gly Met Phe Val Pro Gln
20 25 30

Cys Asp Glu Tyr Gly His Tyr Val Pro Thr Gln Cys His His Ser Thr
35 40 45

Gly Tyr Cys Trp Cys Val Asp Arg Asp Gly Arg Glu Leu Glu Gly Ser
50 55 60

Arg Thr Pro Pro Gly Met Arg Pro Pro Cys Leu Ser Thr Val Ala Pro

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<210> 30
<211> 82
<212> PRT
<213> Human IGF-Binding Protein-3
<400> 30
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Lys Lys Gly Phe Tyr Lys Lys Lys Gln Cys Arg Pro Ser Lys Gly Arg
35 40 45

Lys Arg Gly Phe Cys Trp Cys Val Asp Lys Tyr Gly Gln Pro Leu Pro
50 55 60

Gly Tyr Thr Thr Lys Gly Lys Glu Asp Val His Cys Tyr Ser Met Gln
65 70 75 80

Ser Lys

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<210> 31
<211> 77
<212> PRT
<213> Human Testican
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<400> 31

Gln Lys Pro Gly Gly Leu Pro Cys Gln Asn Glu Met Asn Arg Ile Gly
1 5 10 15

Lys Leu Ser Lys Gly Lys Ser Leu Leu Gly Ala Phe Ile Pro Arg Cys
20 25 30